

ABSTRACT

An electrical and thermal contact for use in a semiconductor device. The electrical and thermal contact includes an intermediate conductive layer, an insulator component, and a contact layer. The intermediate conductive layer may contact a structure of the semiconductor device. The insulator component, which is fabricated from a thermally and electrically insulative material, may be sandwiched between the intermediate conductive layer and the contact layer, which may substantially envelop the insulator component. The electrical and thermal contact may be fabricated by a process which includes forming a first thin layer on a surface of the semiconductor device, depositing a dielectric layer adjacent the first thin layer, patterning the dielectric layer to define the insulator component, forming a second thin layer adjacent the insulator component and in partial contact with the first thin layer, and patterning the first and second thin layers to define the intermediate conductive layer and the contact layer, respectively. Due to its structure, which requires relatively little electrical current to generate a desired amount of heat, the electrical and thermal contact effectively contains heat within and prevents heat from dissipating from a contacted structure, and is particularly useful for contacting and inducing a change in the electrical conductivity of structures which include phase change materials.